Fear Appeal Intensity of Visual Cigarette Warnings: An Experimental Research on Turkish Young Adults

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Abstract

Warnings used on cigarette packages differ among countries. These differences are related to the intensity of fear appeal and chosen visuals. Researches on fear appeal show that there is a positive linear relationship between message acceptance and fear arousing conditions. The aim of this research is to assess the most effective fear intensity level of cigarette warnings. An experimental research is conducted on 126 Turkish young adults. They are separated in three groups according to developed visual cigarette packages with varied fear intensity. Their affective responses, recognition ranks and intentions to quit smoking were compared. The results indicate that there is surprisingly no statistically difference between visuals in terms of intensity of fear appeal whereas visual warning with higher fear intensity is perceived as more effective on eliciting intention to quit smoking than others. According to subjects' statements, this result may be explained by the fact that fear intensities of all visual warnings are comparatively rather higher than Turkish local cigarette warnings.

Keywords: Cigarette warnings, visual warnings, fear appeal, cigarette package design, health communication

1. Introduction

Within the concept of unhealthy products such as cigarette, there are many strategies to prevent disease and promote health (Montazeri and McEwen, 1997, p. 29) by emphasizing the damage. Complicated stimuli as legal warning contents on packaging utilises strategies aimed to prevent diseases cover warning messages that imply negative consequences of smoking. They are also known as loss-frame messages in literature (Pischke et al., 2013, p.327, Goodall and Appiah, 2008, p. 118-119). On the other hand, strategies aimed to promote health use warning messages that indicate positive consequences of quitting smoking. They are also known as gain-frame messages in literature (Pischke et al., 2013, p. 327; Goodall and Appiah, 2008, p. 118-119).

The aim of the application of all kind of strategies is to attempt to motivate potential and current users to process warning information and to take action (Shimp, 2007, p. 312). Researches on fear appeal present that there is a positive relationship between message acceptance and fear-arousing conditions (Kees, Burton, Andrews and Kozup, 2010, p. 266). Fear is identified as a negatively valenced emotion, accompanied by a high level of arousal (Witte and Allen 2000, p. 592). Rogers (1975, p. 94) states the perceived threat and the perceived efficacy as the determinant variables for fear concept. According to these variables, perceived intensities of fear appeals may differ. Nevertheless, intensity degree of the threat in fear appeal causes ethical arguments. Although many researchers have been done, there is still no consensus on what intensity of aroused fear is the most effective (Shimp, 2007, p. 312, 313).

Hierarchy of effects model widely accepted as a basic framework for evaluating the perception of warnings (Stewart and Martin, 1994, p. 4; Krugman, Fox, Richard and Fischer, 1999, p. 99). The model suggests that the consumer reactions to any communication message occur as a three multiphase process.

These phases are affective, cognitive and conative reactions (Egan, 2007, p. 44). Within the context of warnings on cigarette packaging, using of fear appeal as a persuasive communication tool by means of fear evoking lead individuals take self-protective actions (Glock, Müller and Ritter, 2013, p. 253).

Utkutug and Demirci (2013) presented the researches on evaluating the effects of varied warning contents on cigarette packaging. Similarly to conducted research by Maynard and others (2012, p. 413), their results state that pictorial warnings are the most effective content for eliciting intention to quit smoking.

As a consequence, the aim of this research is to assess the most effective cigarette warning related to throat cancer among verbally similar but vary as visual fear intensities.

2. Method

2.1. Stimuli

The visuals used in the research are prepared without brand information; only front sided including written and visual warnings by Adobe Collection CS5 software. The visuals of three combined warnings are chosen with increasing fear intensity within the context of throat cancer. However, the written warning which means 'Smoking may cause throat cancer' is the same in all three visuals.

The first visual was originally utilized by The New York City Department of Health and Mental Hygiene, represented as Figure 1(a), was exposed to first group of sample. The second visual was proposed as a legal warning for U.S., represented as Figure 1(b), was exposed to second group of sample. The third visual was admitted as a legal warning by European countries, represented as Figure 1(c), was exposed to third group of sample.

Figure 1(a): Visual Warning with Less Fear Intensity

Figure 1(b): Visual Warning with Moderate Fear Intensity

Figure 1(c): Visual Warning with Higher Fear Intensity

2.2. Sample

An experimental research is conducted on Turkish young adults who are between the age of 21 and 23. A developed questionnaire is applied to 126 subjects in order to determine homogenous groups of experiment. In this questionnaire, following data are gathered:

• Does any of your related suffer from cigarette?
• Do you smoke?
• If you are smoking, how many cigarettes you smoke for a day?
• If you are smoking, how long you have been smoking?

After the evaluation of answers, purposive sampling method is used and 126 senior students are randomly assigned to three groups which have same characteristics.

2.3. The Method of Data Collection

The experimental research method is used for data gathering and between groups design is applied. Subjects are informed about the research aims and process, before the exposure of visuals by Microsoft Office PowerPoint 2007. All subjects are tested under the same experimental conditions. There is no limitation for exposure time. After the exposure, subjects were asked to answer the survey.

The first dimension of the survey contains items about fear intensity and recognition of warning contents. The second dimension contains six attitudinal expression items related with the intention to quit smoking. The fear intensity and attitudinal items are structured as five-point Likert scale. Gathered data are analysed with IBM SPSS Statistics 21.0 software.

2.4. The Reliability

A pretest is done to 83 subjects for measuring the reliability of the research. The internal consistency values calculated for the 9 items of the scale, corrected-item total correlations vary between 0.331 and 0.930. Though the coefficient of fear intensity item is the smallest, it is kept in the scale since it is necessary for the research purpose. Cronbach's alpha values of dimensions are 0.896 and 0.768 respectively.

3. Results

3.1. Frequencies

Demographic, affective, cognitive and behavioural characteristics of subjects are represented in Table 1. According to Table 1, woman and man distribution percentage of sample is equal. Approximately half of the sample (% 47.6) states that smoking damaged one of the relatives' health. Only % 25.4 of sample smokes regularly and most of them (% 87.1 of 31 smokers) have been smoking more than 3 years. Most of smoker subjects (% 74.2 of 31 smokers) declare that they smoke less than one package per a day. % 92.9 of subjects found fear appeal of visuals moderate and over the moderate level.

True recognition percentages of warning's visual and written themes are relatively % 73 and % 95.2. % 57.9 of sample believes that warnings are effective to arouse intention to quit smoking whereas % 30.9 does not. More than the half of sample (% 48.4) thinks that warnings annoy people much more than arouse intention to quit smoking (with respect to 'I do not believe that warnings make a difference even though they annoy people' item). % 24.6 of sample does not feel disgust from cigarette because of the warnings whereas % 56.3 of them feels. More than the half of the sample (% 69) considers that warnings are ignored. Effectiveness of pictorial and verbal factors of warnings asked as two different items. % 16.6 of sample declares that pictures of Turkish warnings attract attention. On the other hand, % 42 of sample thinks that Turkish verbal warnings are effective whereas % 42.9 of them does not.

Table 1: Frequencies of Sample

(n=126)		Frequency	Percent %
Gender	Woman	63	50.0
	Man	63	50.0
	Total	126	100.0
Damage	No	66	52.4
	Yes	60	47.6
	Total	126	100.0
Smoking	Not smoking	94	74.6
	Smoking	32	25.4
	Total	126	100.0
Duration	Never	95	75.4
	0-2 years	4	3.2
	3-5 years	16	12.7
	6 years +	11	8.7
	Total	126	100.0
Amount	None	95	75.4
	Less than 1 package	23	18.3
	Approximately 1 package	7	5.6
	More than 1 package	1	0.7
	Total	126	100.0
Fear Intensity	No response	6	4.8
	Lesser	3	2.3
	Moderate	32	25.4
	Higher	36	28.6
	Much higher	49	38.9
	Total	126	100.0
Recognition Rank of Visual Content	False	34	27.0
	True	92	73.0
	Total	126	100.0
Recognition Rank of Written Message	False	6	4.8
	True	120	95.2
	Total	126	100.0

(n=126)		Frequency	Percent %
I believe that warnings are effective to arouse intention to quit smoking.	Strongly disagree	1	0.8
	Disagree	29	23.0
	Neither agree nor disagree	23	18.3
	Agree	56	44.4
	Strongly agree	17	13.5
	Total	126	100.0
I do not believe that warnings make a difference even though they annoy people.	Strongly disagree	7	5.6
	Disagree	32	25.4
	Neither agree nor disagree	26	20.6

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	Agree	56	44.4
	Strongly agree	5	4.0
	Total	126	100.0
Warnings elicit disgust from cigarette.	Strongly disagree	6	4.8
	Disagree	25	19.8
	Neither agree nor disagree	24	19.0
	Agree	50	39.7
	Strongly agree	21	16.7
	Total	126	100.0
I believe that people ignore the warnings.	Strongly disagree	2	1.6
	Disagree	18	14.3
	Neither agree nor disagree	19	15.1
	Agree	66	52.4
	Strongly agree	21	16.6
	Total	126	100.0
I do not think the pictures of Turkish warnings attract attention.	Strongly disagree	25	19.8
	Disagree	57	45.2
	Neither agree nor disagree	23	18.3
	Agree	19	15.1
	Strongly agree	2	1.6
	Total	126	100.0
I do not think Turkish verbal warnings are effective.	Strongly disagree	12	9.5
	Disagree	42	33.3
	Neither agree nor disagree	19	15.1
	Agree	46	36.5
	Strongly agree	7	5.6
	Total	126	100.0

3.2. Comparisons of Warnings with Respect to Fear Intensity

According to result of Kolmogorov Smirnov test, none of the variables distribute normally ($p < .001$). Thus, Kruskal Wallis test is done to identify whether there are any meaningful difference between developed warnings with respect to fear intensity of subjects. The results are presented in Table 2.

Table 2: Comparisons of Warnings with Respect to fear Intensity (n=126)

Groups*	n	R	X²	p
Experiment 1	42	56.58	4.571	0.1
Experiment 2	42	61.52		
Experiment 3	42	72.39		

* Experiment 1. Subjects who saw graphical warning with low fear intensity.
  Experiment 2. Subjects who saw graphical warning with moderate fear intensity.
  Experiment 3. Subjects who saw graphical warning with high fear intensity.

According to the significance value for 95 % interval confidence, no meaningful difference is found between developed warnings with respect to varied fear appeals. The findings reveal that intensity of fear appeal does not surprisingly influence the affective evaluation of warnings.

3.3. Comparisons of Warnings with Respect to Memory Trace

According to results of Kolmogorov Smirnov test, both data of pictorial themes' and written content's recognition ranks do not distribute normally ($p < .001$). Kruskal Wallis test and Mann Whitney U tests are done to identify whether there are any meaningful difference between developed warnings with respect to recognition ranks of pictorial themes. The results are presented in Table 3 and Table 4.

Table 3: Comparison of Warnings with Respect to Recognition Ranks of Pictorial Theme (N=126)

Groups	n	R	X^2	p
Experiment 1	42	61.0	17.823	0.000
Experiment 2	42	52.0		
Experiment 3	42	77.5		

Table 4: Meaningful Differences between Groups With Respect to Recognition Ranks of Pictorial Themes (N=126)

Groups	n	R	U	P	Comparison
Experiment 1	42	61.0	756.0	0.180	1-2
Experiment 2	42	52.0	651.0	0.002	1-3
Experiment 3	42	77.5	525.0	0.000	2-3

According to the significance values for 95 % interval confidence, meaningful differences are found not only between group of experiment 1 and experiment 3, but also between group of experiment 2 and experiment 3. The findings emphasize that students remember more easily the visual warning with higher fear intensity than the other kind of warnings.

On the other hand, Kruskal Wallis test is done to identify whether there are any meaningful difference between developed warnings with respect to recognition ranks of written content. The results are presented in Table 5.

Table 5: Comparison of Warnings With Respect to Recognition Ranks of Written Content (N=126)

Groups*	n	R	X^2	p
Experiment 1	42	63.5	1.042	0.6
Experiment 2	42	62.0		
Experiment 3	42	65.0		

According to the significance value for 95% interval confidence, no meaningful difference is found between developed warnings with respect to varied fear appeals. The finding emphasizes that written warning content does not affect the memory trace of warning.

3.4. Comparisons of Warnings with Respect to Intention to Quit Smoking

According to results of Kolmogorov Smirnov test, data of intention to quit smoking do not distribute normally (p < .001). Kruskal Wallis test and Mann Whitney U tests are done to identify whether there are any meaningful difference between developed warnings with respect to subjects' intention to quit smoking. The results are presented in Table 6 and Table 7.

Table 6: Comparison of Warnings with Respect to Intention to Quit Smoking (n=126)

Groups*	n	R	X^2	p
Experiment 1	42	53.70	6.709	0.035
Experiment 2	42	63.61		
Experiment 3	42	73.19		

Table 7: Meaningful Differences between Groups with Respect to Intention to Quit Smoking (n=126)

Groups	n	R	U	p	Comparison
Experiment 1	42	53.70	756.0	0.180	1-2
Experiment 2	42	63.61	651.0	0.002	1-3
Experiment 3	42	73.19	525.0	0.000	2-3

According to the significance values for 95% interval confidence, meaningful differences are found not only between group of experiment 1 and experiment 3, but also between group of experiment 2 and experiment 3. The findings indicate that third visual which chosen as the highest fear appeal is perceived as being the most effective on eliciting intention to quit smoking than other kind of warnings.

3.5. Comparisons of Non-Smokers' and Smokers' Perceptions of Cigarette Warnings

Kruskal Wallis test is done to determine whether there is a meaningful difference between attitudinal and fear intensity among non-smokers and smokers. Data of fear intensity are reorganized as 'lesser fear intensity', 'moderate fear intensity' and 'higher fear intensity' for those analyses. Median of fear intensity variable is calculated as '4' for non-smokers and smokers so that values which smaller than '4' are coded as 'lesser fear intensity', equal to '4'are coded as 'moderate fear intensity' and bigger than '4' are coded as 'higher fear intensity'. The results of test reveal that there are significant differences for some attitudinal outputs. The results of test are represented in Table 8.

Table 8: Comparison of Non-Smokers' and Smokers' Perceptions of Cigarette Warnings (N=126)

Smoking Behavior	Attitudinal Outputs	Fear Intensity	n	R	X²	p
Non-smokers	Warnings elicit disgust from cigarette.	Lesser	28	37.52	8.284	.016
		Moderate	27	45.81		
		Higher	39	55.83		
Smokers	Warnings elicit disgust from cigarette.	Lesser	13	11.35	11.347	.003
		Moderate	9	15.50		
		Higher	10	24.10		
	I do not think the pictures of warnings attract attention.	Lesser	13	21.04	6.953	.031
		Moderate	9	15.89		
		Higher	10	11.15		

According to answers, non-smoker and smoker subjects who feel higher fear intensity perceive that warnings elicit disgust from cigarette. In addition, smokers who feel lesser fear intensity think that the visuals of warnings do not attract attention.

4. Discussion and Conclusion

Within the context of conducted research, affective responses, recognition ranks and intentions to quit smoking of seniors are collected and analysed. The findings are cited in four dimensions as comparisons of warnings with respect to fear intensity, comparisons of warnings with respect to memory trace, comparisons of warnings with respect to intention to quit smoking, comparison of non-smokers' and smokers' perceptions of cigarette warnings respectively.

According to the finding of first dimension's analyses, no meaningful difference is identified between warnings with respect to fear intensity (Table 2). Literature suggest that fear appeals about negative consequences of smoking on health persuade smokers to change smoking behaviour by attracting attention. According to the result, visual fear intensity did not influence the affective responses surprisingly even though stimuli evoke intense fear. Contrary to expectation, this finding of the current research does not support previous researches.

According to the finding of second dimension's analyses, meaningful differences are found not only between visual warnings with low and high fear intensity; but also between visual warnings with moderate and high fear intensity with respect to memory trace of pictorial themes. Similar to Kees and colleagues' results (2010), the findings emphasize that subjects remember more easily the high fear intensity graphics than the other kind of warnings (Table 3). Previous researches regarding on cognitive reactions revealed that graphic warnings are more visible (O'Hegarty, Pederson, Yenokyan, Nelson and Wortley, 2007, Hoek, Maubach, Gendall and Searle, 2005), easier to understand and increase awareness and knowledge of the health hazards of smoking (Hammond et al., 2006, Trasher, Hammond, Fong and Arillo-Santillan, 2007). On the other hand, no meaningful differences identified between visuals with respect to memory trace of written messages. Within the context of Gestalt Theory, the congruity between pictorial themes and written messages may also strengthen the memory trace of warnings via by working as a clue (Arnheim, 1972). Mentally associating visual warning with written message may be easier, because of the plain structure of the written message.

According to the finding of third dimension's analyses, meaningful differences are found not only between visual warnings with low and high fear intensity; but also between visual warnings with moderate and high fear intensity with respect to elicit intention to quit smoking (Table 4). The finding indicates that third visual with which is high fear intensity perceived as more effective on eliciting intention to quit smoking than other kind of warnings. In other words, the cigarette warning visuals accepted by U.S. and European countries are found more effective than Turkey's. Moreover, this finding provides strong support for conducted researches by Hammond et al. (2003) and Kees et al. (2010).

According to last dimension's results, statistically meaningful differences found between attitudinal outputs towards warnings with respect to fear intensity level (Table 8). Both non-smoker and smoker subjects who feel higher fear intensity think that warnings elicit disgust from cigarette. Moreover, smokers who feel lesser fear intensity state that pictures of warnings do not attract enough attention. Reaction of subjects do not differ whether they smokes or not. So it can be interpreted that chosen visuals are effective to take action against smoking by both users and potential users.

The comparison of first and the third dimensions' results present an interesting case. The third visual with higher fear intensity perceived as more effective on eliciting intention to quit smoking whereas all warnings are identified as visuals with higher fear intensity comparatively to Turkish ones by subjects. After the experiment, subjects state that all developed visuals are quite intimidating than the Turkish visual warnings. It is assumed that the reason of this may be the inconsistency of fear intensities between exposed visuals in the research and accepted visuals in Turkey. In accordance with the Provisional Article 3th of 'Regulation on Methods and Essentials concerning the Manufacture Type, Labeling and Surveillance for the Protection from the Damages of Tobacco Products', 'Source list' (Official Gazette No. 27065 on 25/11/2008) including 14 combined warnings is determined in Turkey (TAMRA, 2008). Most of the accepted warnings in Turkey cover less fear intensity, weak relationship between message themes and visual themes whereas chosen stimuli in this research use intensive fear visual contents. The exposed visuals might have been unconsciously compared with the Turkish warnings. As a consequence of that evaluation process, each of the exposed visuals might have been perceived similar and visual warning with higher fear intensity by subjects.

5. Suggestions

In the light of the conducted research, application of the congruity of warning contents (visual and written message) strategy is primarily recommended instead of fear appeal strategy. Plain written messages and perceived visual warnings with high fear intensity should be chosen as tactics to attract attention. However, these suggestions are developed within the context of loss-framed message strategy. Similar experimental researches have to be conducted to determine most effective tactics for gain-framed message strategy.

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